located to the north of both monitoring stations. However, there is a greater degree of scatter in these data and several of the events appear to occur when winds are light and variable.

Soon after the initiation of TGM monitoring at the Riegelwood Flynn site, the chlor-alkali plant announced plans to cease mercury cell chlorine production and convert to a membrane process that would eliminate the active use of mercury. Shipment of mercury to off-site locations continued during the spring and summer of 1999 with residual clean-up extending into 2000.

Average levels of TGM have declined at all three monitoring stations through 1999 and early 2000. This pattern is most pronounced at Lake Waccamaw, where TGM levels are now consistent with "background" rural/remote locations. Short-term elevations in TGM continue to arise at the Riegelwood sites, but the frequency and magnitude of these phenomena are greatly reduced relative to earlier time periods.

Reactive Gaseous Mercury: Water-soluble forms of mercury in air include $HgCl_2$ and other compounds incorporating mercury in the mercuric (Hg^{2+}) oxidation state. In the atmosphere these species may exist as gases or associated with particulate matter (Lindberg). The atmospheric residence time for RGM emitted from point sources is likely much shorter than that for TGM which is known to persist in the atmosphere for months or years. Due to the high degree of water-solubility it is believed that these species are subjected to atmospheric removal processes involving wet or dry deposition. Thus, it is important to gain an understanding of the chemical speciation of mercury in point source emissions and ambient air to better predict the impact on nearby aquatic systems.

In March of 2000, we initiated ambient air monitoring for RGM at Riegelwood, NC using a speciation method that employs an annular denuder system for collection of water-soluble forms of mercury. Our primary goal was to determine whether any consistent pattern existed between fluctuations in TGM and observed concentrations of RGM. In figure 7 we present preliminary data on levels of RGM and TGM simultaneously measured at Riegelwood Ballpark between March 7 – 18, 2000. From this limited data set, no consistent pattern appears to emerge. On two occasions, 2-hour average TGM levels rose above 4 ng/m^3, but while RGM was increased during the event on March 18, it was depressed during the March 14 event. This could suggest that elevated TGM levels are unrelated to RGM fluctuations or that variable atmospheric conditions were differentially affecting the various mercury species. Rain events are known to depress RGM levels in air while leaving TGM levels unchanged (Lindberg). It is conceivable that precipitation during the March 14 sampling event scavenged RGM from the air while still allowing the TGM plume to reach the sampling device. Future studies will incorporate more thorough site-specific information on precipitation and humidity levels.

It is worth noting that an intermittent pattern of depressed TGM readings appeared during this and subsequent RGM monitoring efforts. On many occasions the first several 5-minute TGM readings immediately following the denuder desorption cycle appeared artificially depressed down to levels as low as 0 ng/m^3. Recovery to expected levels (~1.5 ng/m^3 or higher) would generally be achieved before the end of the 2-hour analysis period. Suspect readings are represented in figure 7 as white columns. We have not yet determined the cause of these anomalies but suspect that they may be related to the release of material from the denuder assembly during heating and desorption that interferes with the collection